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10/522,680	10/18/2005	Osamu Nomura	Q86054	1762
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SUGHRUE-265550 2100 PENNSYLVANIA AVE. NW WASHINGTON, DC 20037-3213			EXAMINER HOGAN, JAMES SEAN	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed December 30, 2009 have been fully considered but they are not persuasive.
2. In response to applicant's argument that The casing nozzle's purpose for its protrusions is for the prevention of molten metal stagnation, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. As such, it is deemed that the teachings of Mori et al in view of Muench read upon the claims.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
2. Claims 1-20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Japanese Patent No. JP 2001/105106 A to Mori et al in view of U.S. Patent No. 5,328,064 to 4,977, 950 to Muench.
3. As per claims 1, 2, 4, 7-9, 12, 13, and 15-18 Mori et al teaches an immersion casting nozzle (as per claim 12) with a molten steel flow hole portion (at (3)) in which a

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plurality of independent spherical protrusion portions (as per claims 12, 15 and 16) and concave portions (4) are greater than or equal to 2 mm, with the length (L) of the protrusion or concave portion is greater than 2 times (H) in mm. Mori et al does not teach its protrusions being in any way discontinuous, or in a zigzag arrangement in both directions parallel and perpendicular (48) to a molten steel flowing direction. Muench teaches (See Figure 4) protrusions (48) on a casting nozzle that are discontinuous in both directions in a zigzag pattern (as per claim 4) parallel and perpendicular to a molten steel flowing direction, and are approximate polygonal pyramid protrusions (as per claims 14, 15 and 17) which has “bases” and can benefit from the sizing information. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have shaped and arranged the protrusions of Mori et al as taught by Muench in order to guarantee molten steel flow in any form of a nozzle that is used to work with molten metal, as the protrusions of both inhibit molten metal stagnation, at even smaller amounts.

4. As per claim 2, it would further be obvious to proclaim (L), a length of a base portion to be less than or equal to $\pi D/3$ where D is the inner diameter of the nozzle outlet, or where (as per claim 7), the protrusions and concave portions and Mori et al separated by no more than 20mm, or as per claims 8 and 9 where dimensions of a protrusion is held between 2-20 mm and the nozzle outlet hole is held to being not smaller than 4 mm as to utilize a proportional formula for a size a protrusion or concave portion size since our reviewing courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the

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claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

5. As per claim 3, Mori et al does not teach the protrusions being 102%-350% as large as the inner surface of the inner surface of the molten steel path, however, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. See *in re Aller*, 105 USPQ 233.

6. As per claim 5, Mori et al teaches protrusion portions that are apparently disposed in the whole or part of the molten steel flow hole portion of the casting nozzle.

7. As per claim 6, Mori et al does not teach, per se, the protrusions not being higher than a meniscus (understood to be a water level present, as per page 14 of the Specification) of the nozzle, as the Figures of Mori et al do not depict a water level, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have proclaimed the water level as a variable of the nozzles usage, and therefore as a Mechanical expedient. It's obvious to one skilled in the art to use routine experimentation to arrive at optimum values (i.e. the water level) to meet the needs of the user for the environment in which the apparatus is to be used as such would be a choice of mechanical expedients.

8. As per claim 10, Mori et al does not teach angled protrusions. However, the angles depicted of protrusions of in a direction parallel to molted steel flow in the

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invention of Muench et al, appear to be at or about 60°, however, since it has been held that discovering a result effective variable (i.e. the angle of the protrusions) involves only routine skill in the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have shaped and arranged the protrusions of Mori et al as taught by Muench in order to guarantee molten steel flow in any form of a nozzle that is used to work with molten metal, as the protrusions of both inhibit molten metal stagnation.

9. As per claim 11, the protrusions of Mori et al are integrated with the body of the casting nozzle.

10. As per claim 19, Mori et al does not teach an inner diameter of the nozzle before the protrusions having an invariable value in a direction parallel to the flow of fluid through it. However, Muench teaches (See Figure 3) at a portion at its top (46a) before any protrusions, is a portion having a substantially invariable value (tapered) in a direction parallel to the fluid flow. Such that, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nozzle of Mori et al with the tapering of Muench in order to assist in inhibiting a spill of fluid flow.

11. As per claim 20, no discernable mechanical or structural difference between the nozzles of Mori et al or Muench is achieved in claiming as “stationary” nozzle. A recitation of the intended use of the claimed invention (i.e. the nozzle being “stationary”) must result in a structural difference between the claimed invention and the prior art in

order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES S. HOGAN whose telephone number is (571)272-4902. The examiner can normally be reached on Mon-Fri, 6:00a-3:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/J. S. H./
Examiner, Art Unit 3752